



Emergency Watershed Protection (EWP) Program Utah

***Santa Clara River – Washington County
December 2010***



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Introduction

1. EWP Background – Process, What, Where.....

2. Project Areas – Selected Utah examples

3. Recovery / Protection Approaches

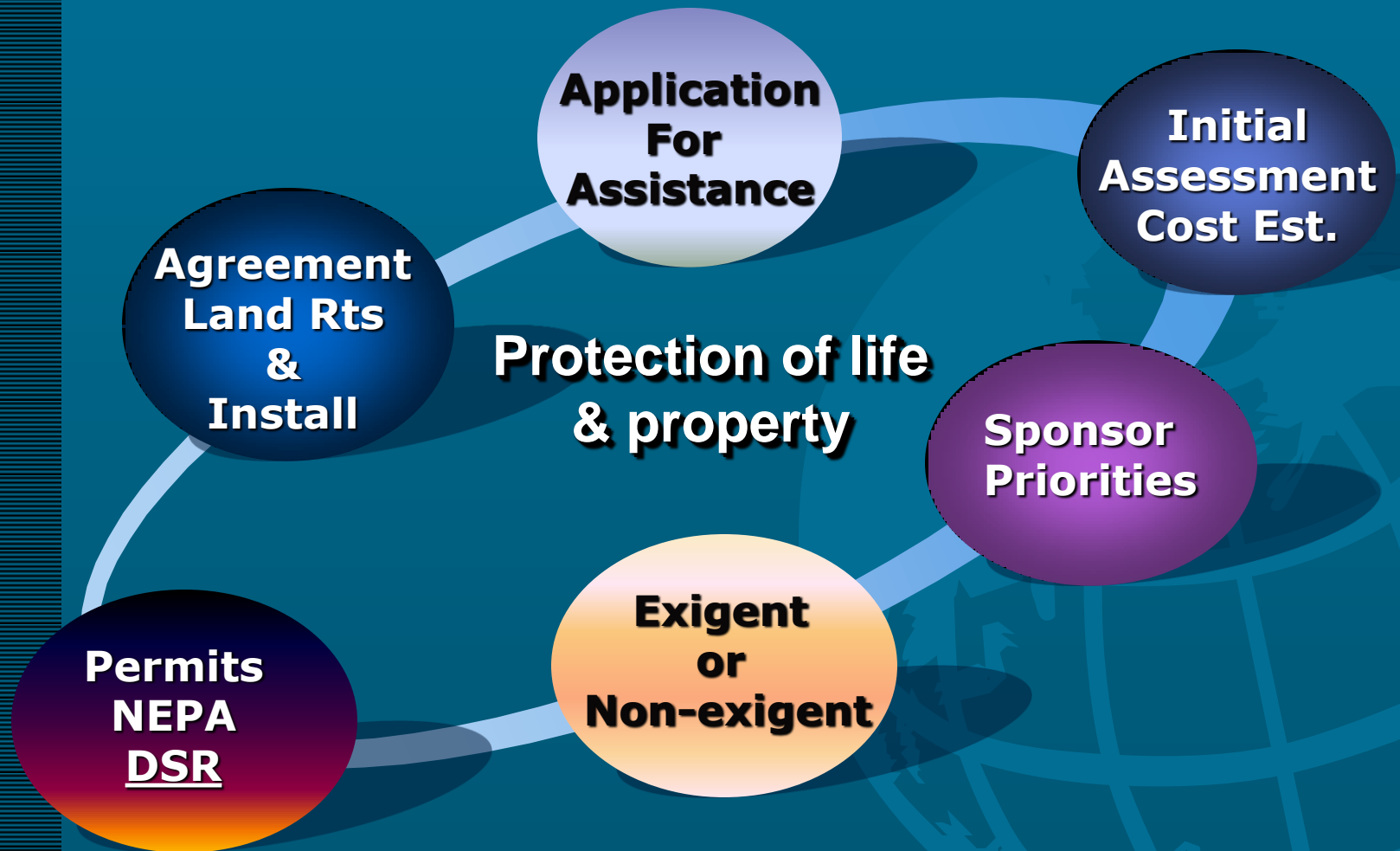
Emergency Watershed Protection - Background

- Has to be a threat to life or property
- Created by a natural disaster → Causing...
Sudden impairment of a watershed
- Need Project Sponsor (*usually County, City*)
- Funding = 75% of Recovery Costs
Technical work = 100% (Eng, Survey, etc.)

Imminent hazard.....?



EWP Background - Process



EWP Background - Limitations

1. No Federal Lands...*except where sponsor /entity has an easement for maintenance*
2. Disposal of carcasses..*except where determined to be threat as debris...*
3. No more than 2X in any 10-year period for structural measures

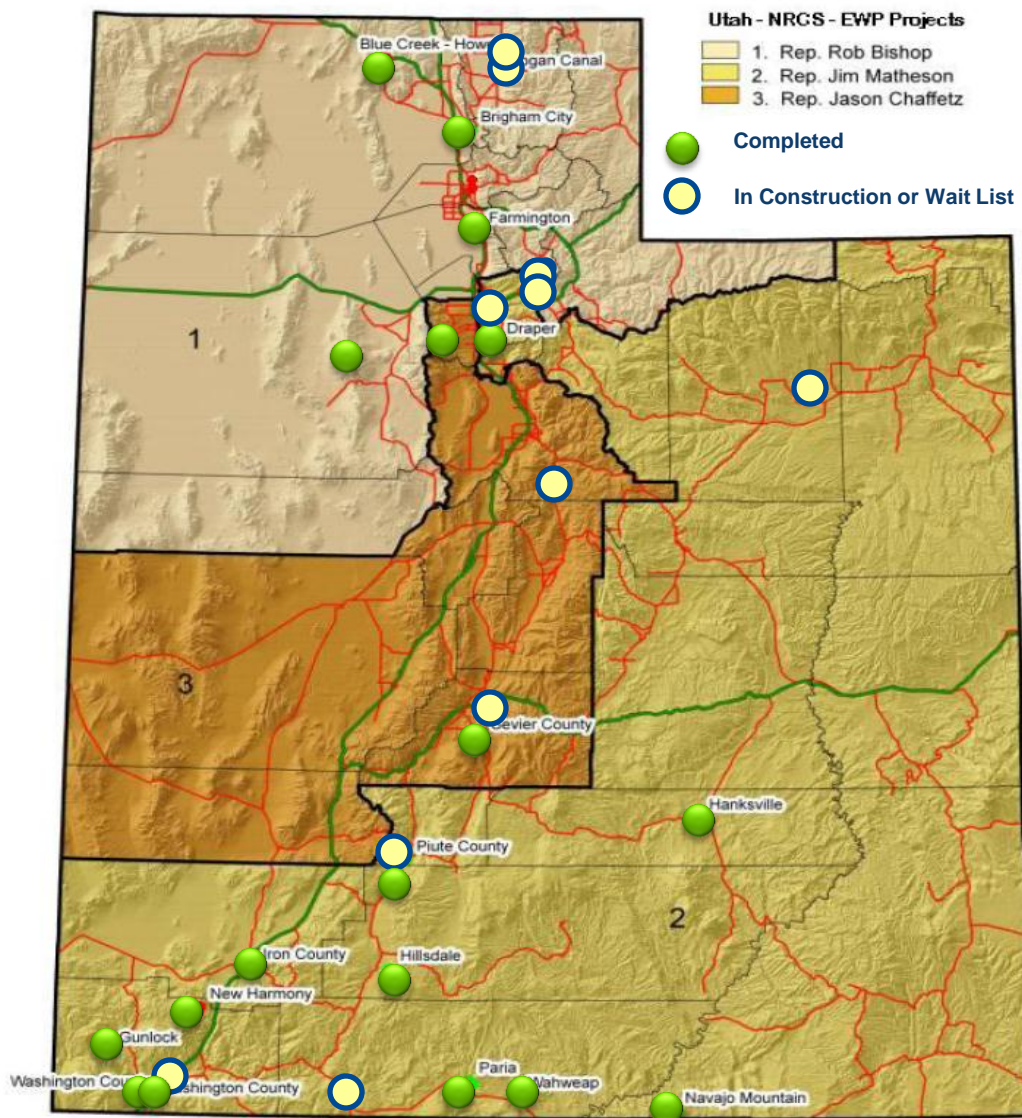
EWP Background - Limitations

4. Performance of O&M

5. Solving watershed or natural problems that existed prior to a natural disaster

6. Can not repair / build / maintain public / private transportation infrastructure

Utah EWP Project Areas



2005 to Feb 2011

Total FA Obligated
\$ 98.8 million

FA Expended
\$ 65.1 million

Wait List:

- Salt Lake Co
- Kanab City
- Kane Co.
- Washington Co
- Sevier Co
- Sanpete Co
- Duchesne Co
- Cache Co

Damage Survey Reports (NEPA)

#	Washington County	Exigent ?	Est Cost \$	Environmental Evaluation/Alts/Special Env						2F-Econ	Photo	Map	TE Cons ult	Arch. Cons ult	Notes
				Soil	H2O	Air	Plant	Animal	Other						
1	Upper Virgin	X		x	x	x	x	x	x	2,012,990	x	x			Houses, land, pipes, bridge
2	Hwy 91	X		x	x	x	x	x	x	1,480,000	x	x			Emergency Alt Rd for I-15
3	Enterprise	X		x	x	x	x	x	x	738,920	x	x			Well, Substation, Pipes, Rds
4	Gunlock-Water pipe	X		x	x	x	x	x	x	835,000	x	x			Water/firefighting, culinary
5	Regional Culinary Pipeline (w/powerline)	X		x	x	x	x	x	x	2,120,000	x	x	x		Culinary water, powerline
6	Toquerville-Cholla			x	x	x			x	808,850	x	x			Spring source 3 Cities
7	St George City sites			x	x	x	x	x	x	1,000,000	x	x			Rock wall repair
8	Santa Clara sites			x	x	x	x	x	x	685,000	x	x			Rock wal repair
9	Debris Removal (Santa Clara/Virgin)			x	x	x	x	x	x	13,550,000	x	x			Restore channel capacity, rem sed/woody debris; plant
10	Virgin-Hurricane-Power			x	x	x	x	x	x	260,000+	x	x			Powerline, culinary line
11	Motoqua			x	x	x	x	x	x	169,410	x	x			Remote comm, rds, house
12	Gunlock to Shiwits Bridge			x	x	x	x	x	x	120,000+	x	x			Rock wall repair
			-							23,400,170					
#	Kane County	Exigent ?	Est Cost \$	Environmental						2F-Econ	Photo	Map	TE Cons ult	Arch. Cons ult	Notes
				Soil	H2O	Air	Plant	Animal	Other						
1	Orderville-Glendale	X		x	x	x			x	345,576	x	x			Culinary/power line, house, CCC structure; <i>Sponsor??</i>
#	Salt Lake County	Exigent ?	Est Cost \$	Environmental						2F-Econ	Photo	Map	TE Cons ult	Arch. Cons ult	Notes
				Soil	H2O	Air	Plant	Animal	Other						
1	Phase I - (Areas 1-12)			x	x	x	x	x	x	28,493,734	x	x	x	x	L.Cottonwood to Vine St
#	Summit County	Exigent ?	Est Cost \$	Environmental						2F-Econ	Photo	Map	TE Cons ult	Arch. Cons ult	Notes
				Soil	H2O	Air	Plant	Animal	Other						
1	Bank Protection/Debris			x	x	x	x	x	x	3,602,559	x	x	x	x	Upper Weber to Browns
2	Irrigation Diversions			x	x	x	x	x	x	1,642,200	x	x	x	x	Peoa S Bench/Marchant
3	Woodenshoe/Freed Add		incl w/above												
			-												

Typical Recovery Measures

- **Stream bank protection**
 - *Rock rip rap*
 - *Bio-eng Techniques: Veg, J-hooks, Geomorph, etc.*
- **Debris Removal**
 - *Sediment*
 - *Large Woody Debris..... where appropriate*
- **Runoff Protection** – silt fence, dikes, aerial seeding
- **Irrigation related protection**
 - *Structural, conveyance features, etc..*
- **Flood Easements** (Future Hope...Weber River?)
 - *Offers to residents within flood areas*

What about Water Quality ??

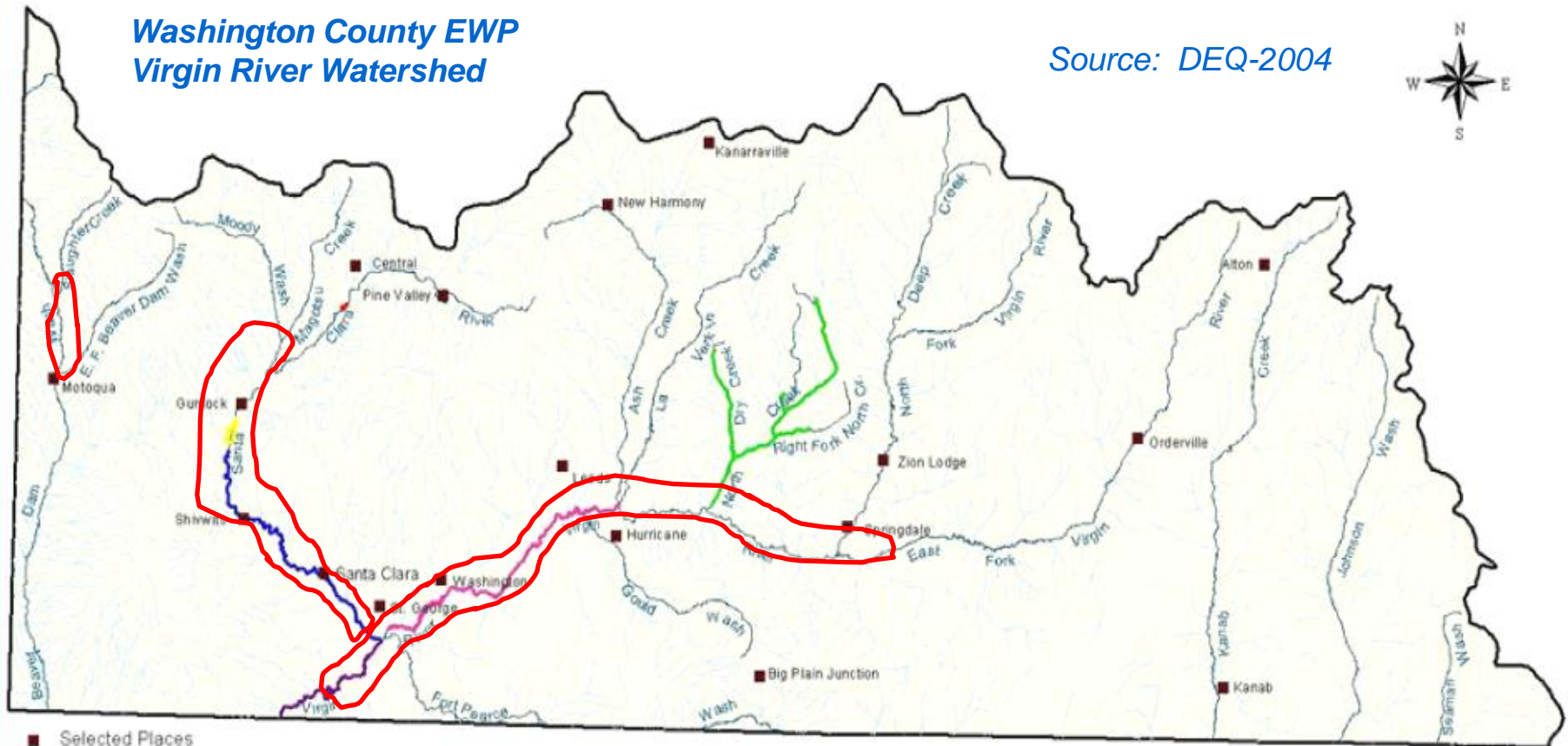
- Sediment
- Bank Stability (AFOs)
- Temperature - Stream
- Salinity ?



EWP and Water Quality ?

Washington County EWP Virgin River Watershed

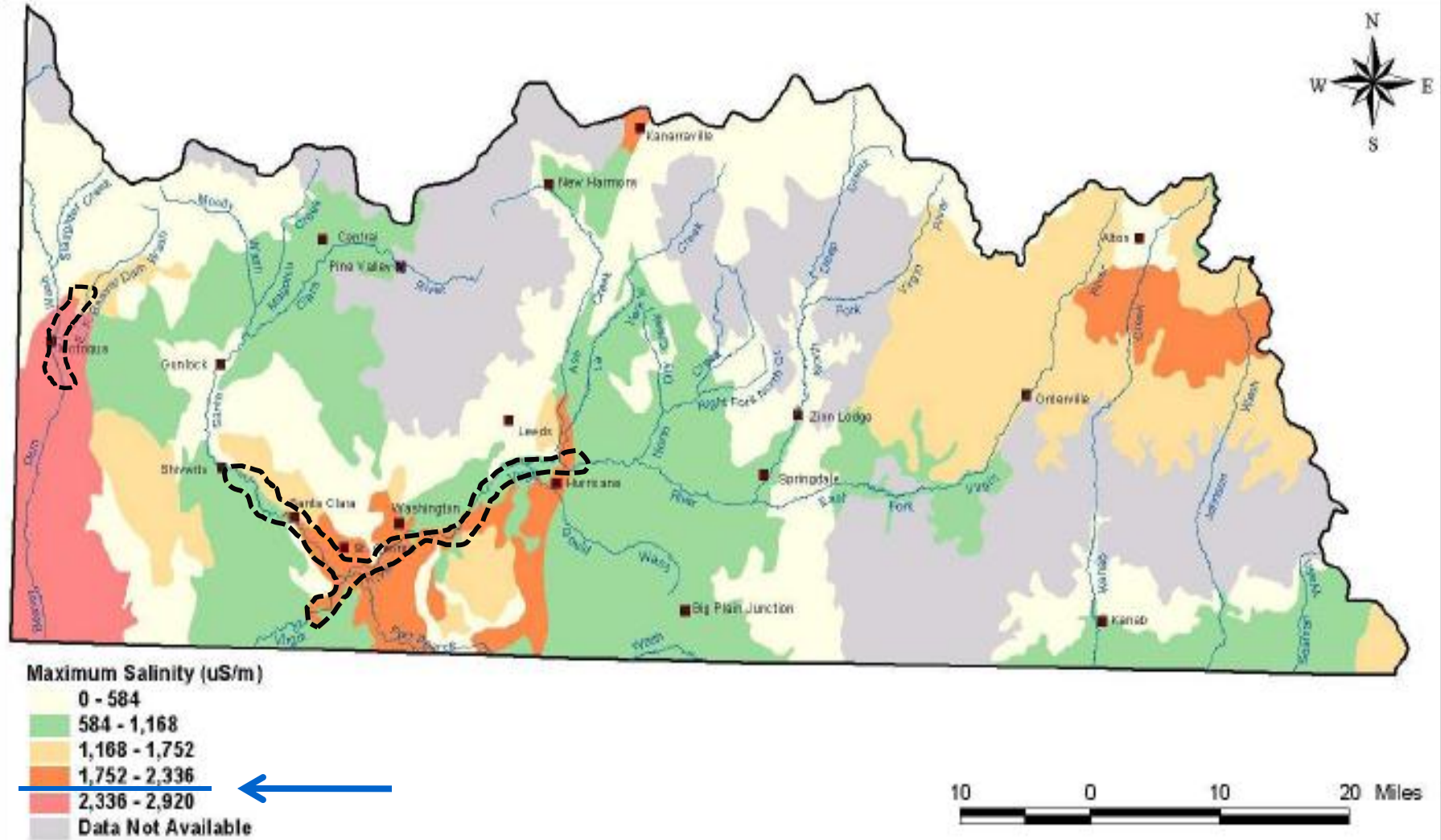
Source: DEQ-2004



General EWP Project Areas



Background Salinity....



Monthly salinity – Virgin River, Littlefield AZ

<u>Year</u>	<u>Month</u>	<u>Flow acft</u>	<u>TDS, Ton</u>	<u>TDS, mg/L</u>
1935	3	15,120	33,561	1632.5
1984	12	16,899	37,625	1637.1
2007	12	16,556	37,101	1647.8

Pah Tempe (La Verkin Springs) : Remove salt added from the springs → reduction of 72,000 tons per year at Littlefield, AZ

<http://www.usbr.gov/uc/progact/salinity/>

Dissolved Solids – Virgin River

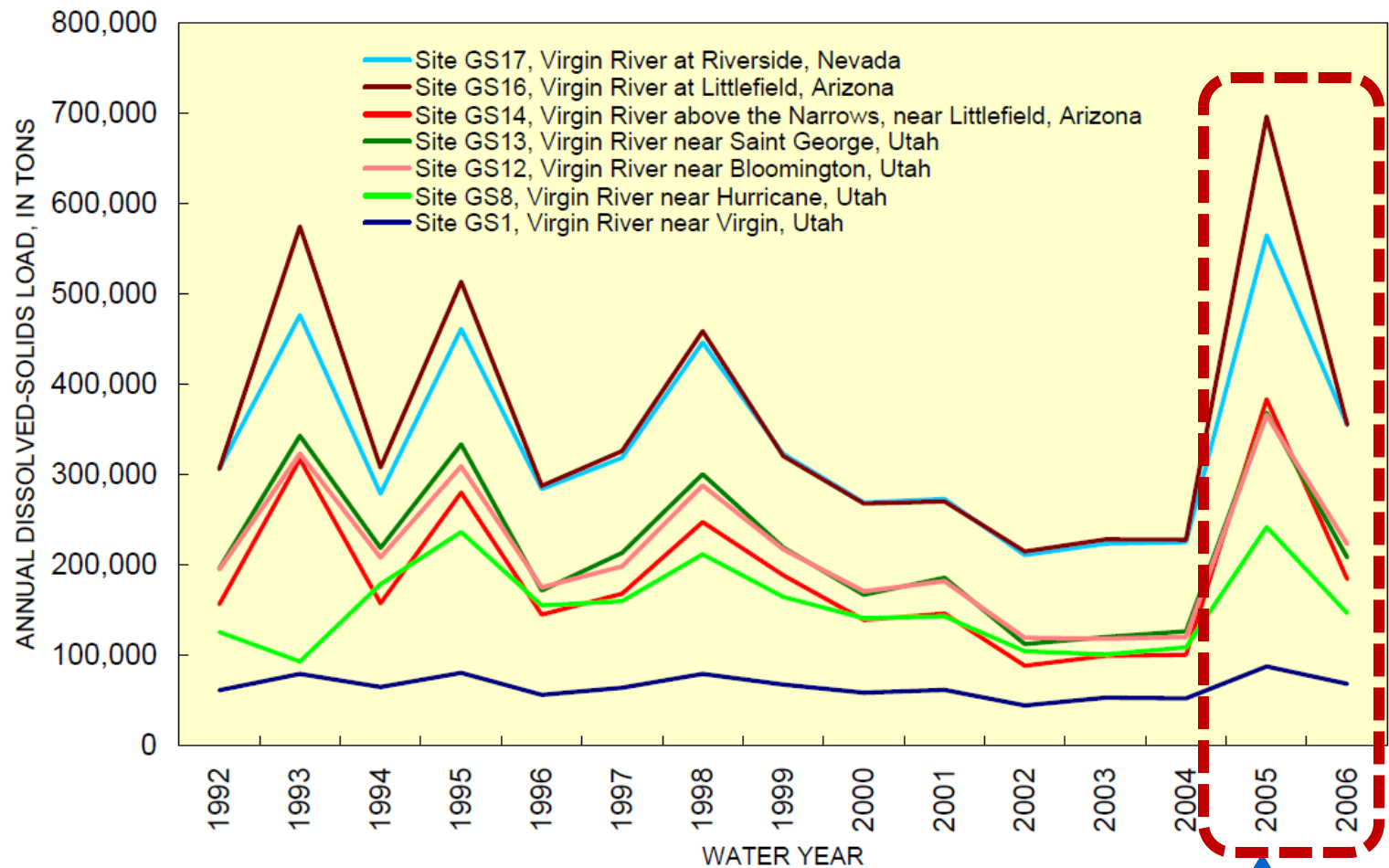


Figure 5. Annual dissolved-solids loads at selected sites in the Virgin River Basin, 1992-2006.

Lower Santa Clara - 2006

Note Veg re-establishment

Utah: Washington County EWP
Lower Santa Clara River
Area where house fell into river



UPPER SANTA CLARA – DECEMBER 2010

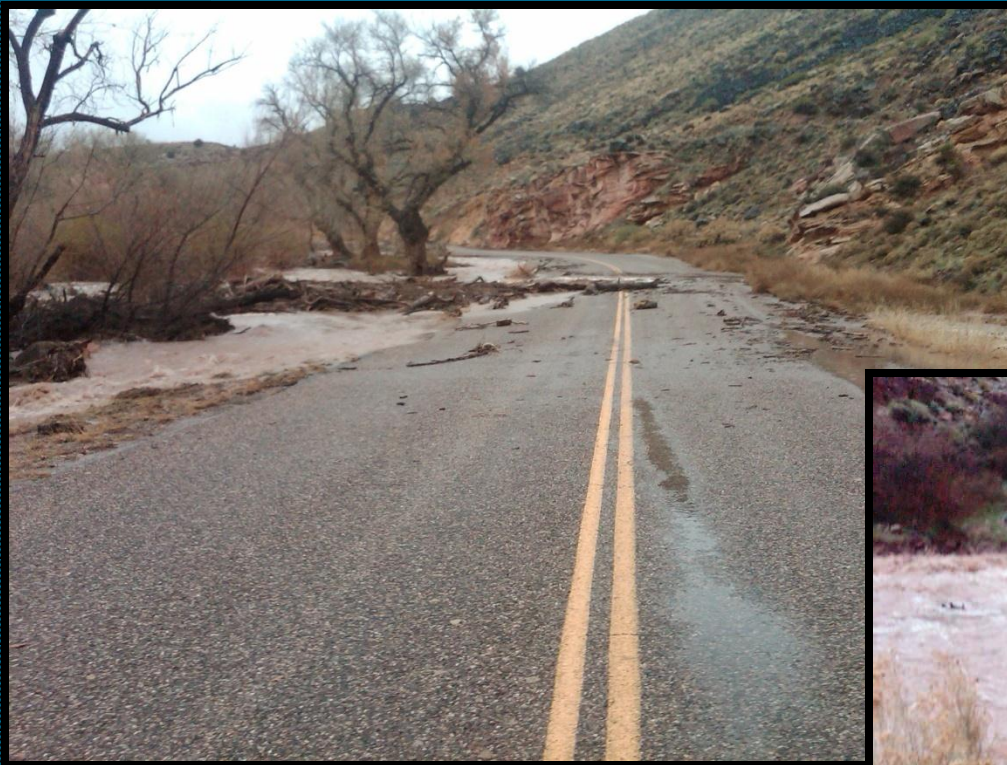


UPPER SANTA CLARA

Geomorphic approach, meander design, plantings, j-hooks



Below Gunlock – Dec 2010



Santa Clara River
Less Debris than
2005



Santa Clara Area



**Debris, Sediment
Alter flows**



WASHINGTON CO. RECOVERY MEASURES

*Santa Clara River – Washington County -
December 2008*



Santa Clara - May 2010



Santa Clara River – new Park area



St George Golf Course Area- Dec 2010



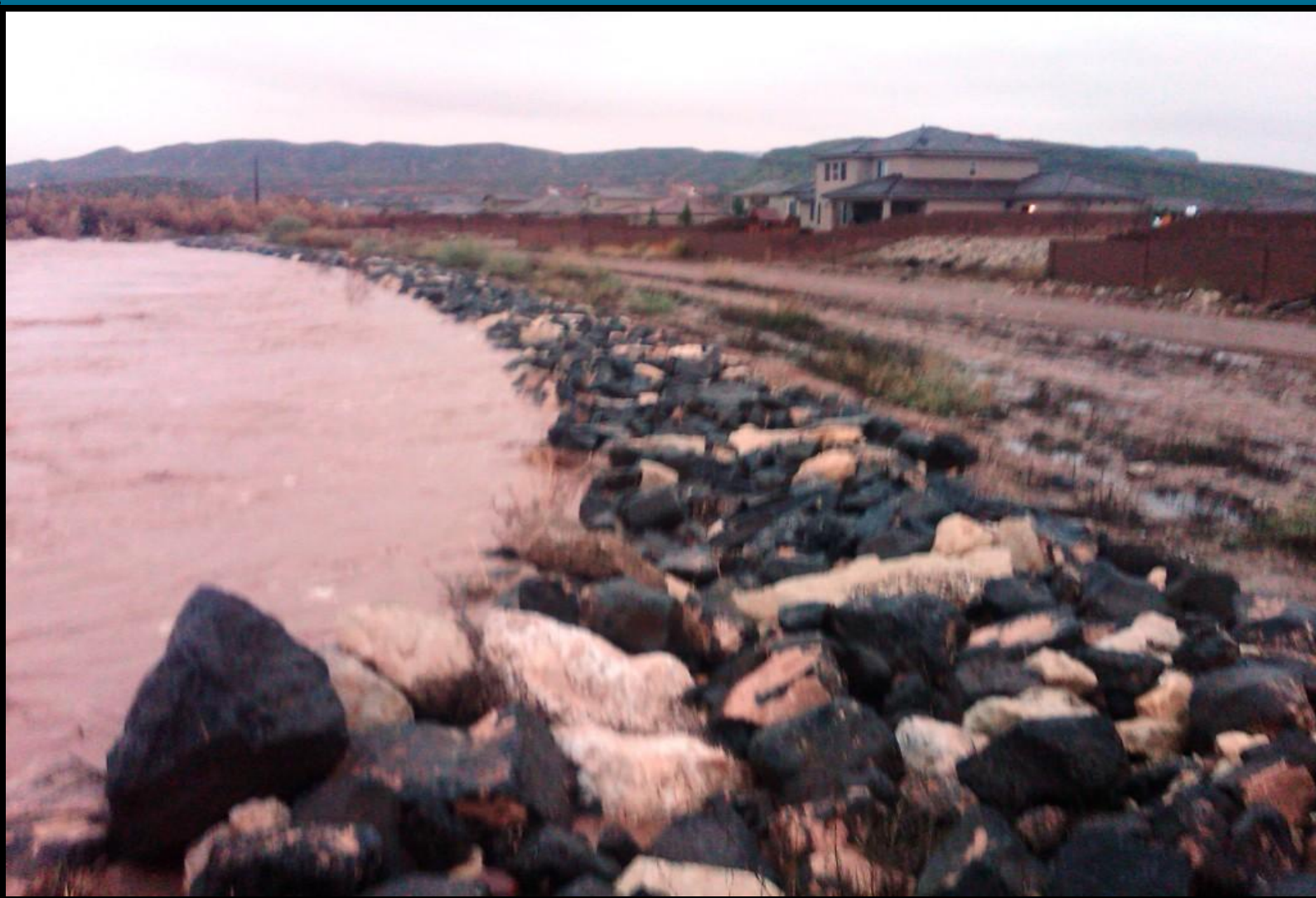
Virgin River

December 2010

Streams need “breathing room” to handle larger flows.....



Virgin River – Dec 2010



Virgin River – Dec 2010



“Trees Ranch” Dam



National
Weather
Service
Warning

Worst Case Scenario of Flash Flood on the Virgin River



Flash Flood
Warning: In effect
for the east fork of
the Virgin River in
Washington County.
Failure of the Trees
Ranch Dam is
possible.

Flow from dam will
enter the East Fork
of the Virgin River
and then merge
with the North Fork
of the Virgin River
east of Rockville.

Washington Co – January 2011

Washington Co. EWP - 2011

Storm Debris



County well-prepared
Rock protection held

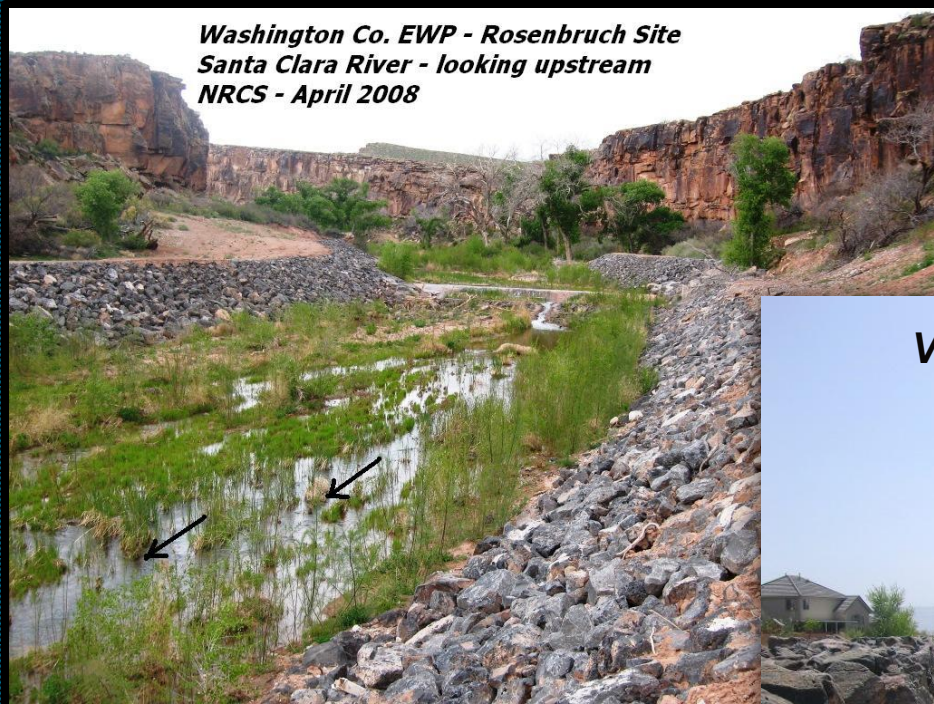
Minor damage to walls

Washington Co. EWP - Jan. 2011 St. George City site - wall damage



Washington County

*Washington Co. EWP - Rosenbruch Site
Santa Clara River - looking upstream
NRCS - April 2008*



Willows returned the following season after construction

Virgin River

*Washington Co. EWP
Washington Fields Area
Downstream of Bridge
NRCS - April 2008*

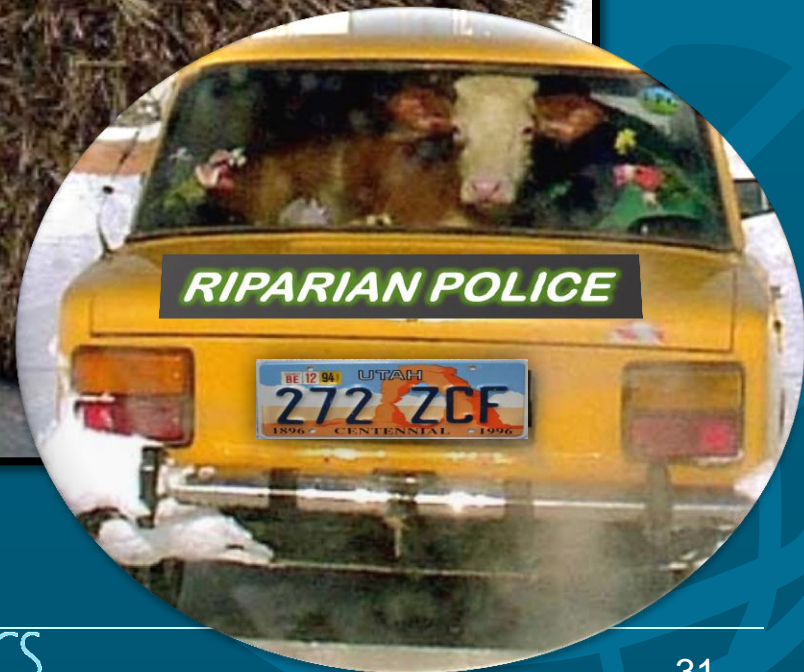


Washington County – Virgin River

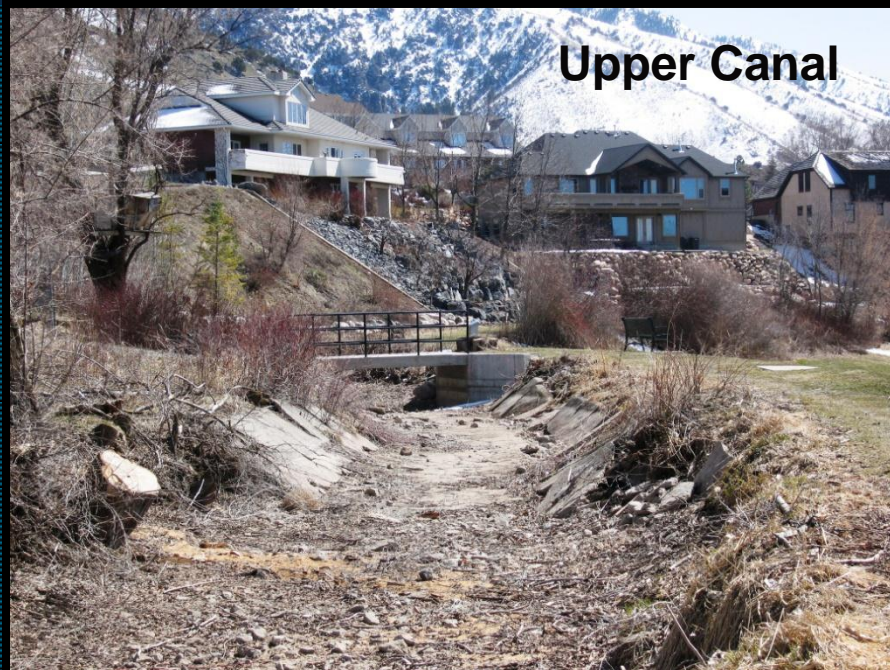
***Washington Co. EWP
Looking upstream to Bloomington Bridge
NRCS - April 2008***



Vegetative Restoration & Protection



Logan Canal EWP Recovery



Logan – Canal EWP



Watershed Impairment

**New Harmony Fire
Washington County**



**Post Fire Threat: Debris Flows
& Invasive vegetation**

**Herriman Fire
Salt Lake County**



New Harmony (Mill Flat Fire)

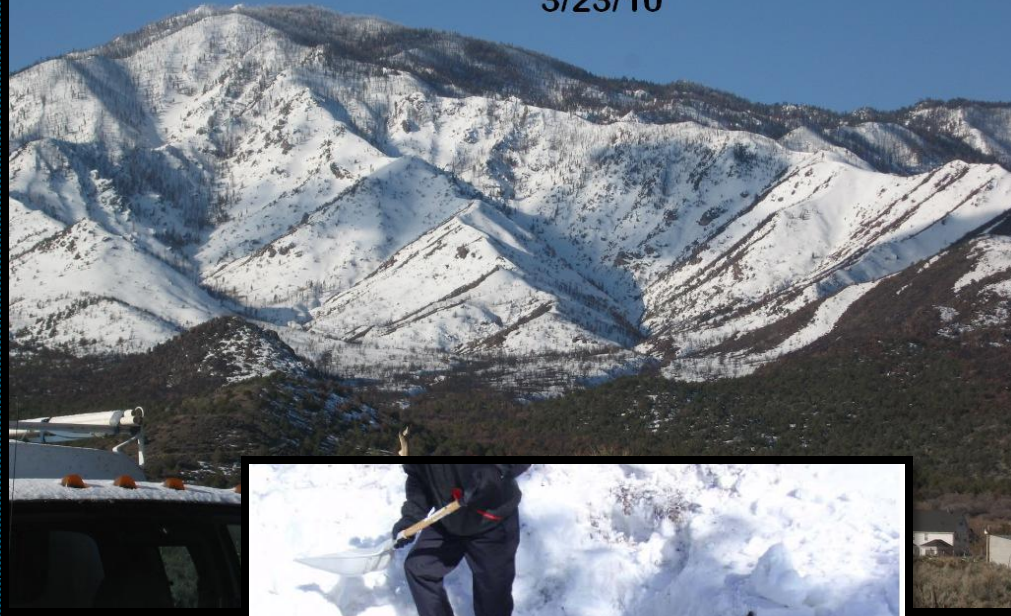
**Record
Snowpack
on burned
slopes**

**Special
study to
determine
hazard for
upcoming
melt**



New Harmony – Fire - Snowpack

New Harmony
Southern Burn Area
3/23/10

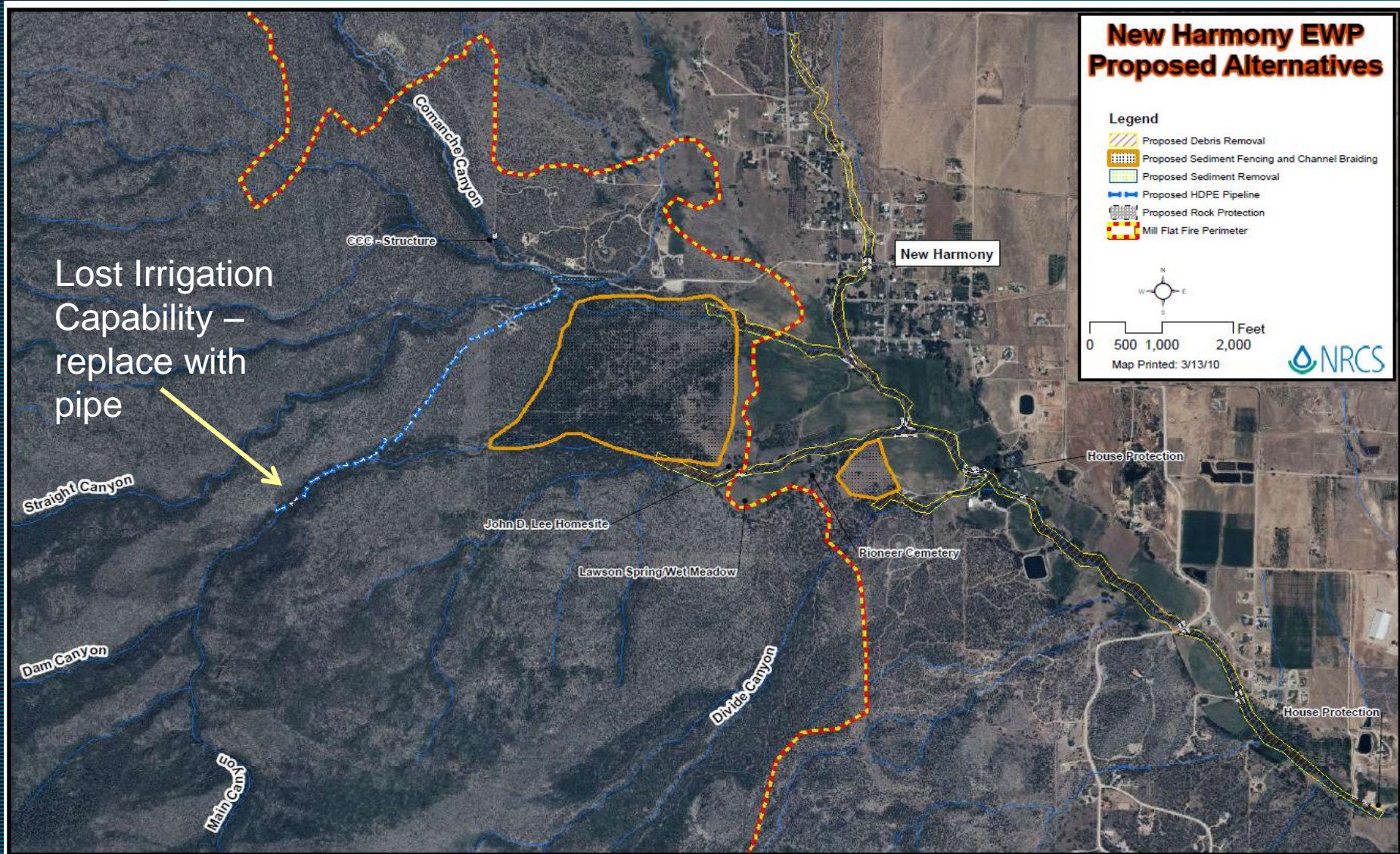


Site 4 - New Harmony
30-33" Water



Soil tests = good capacity for
infiltration = lower risk for
snowmelt debris flow

New Harmony Recovery



POST-FIRE RECOVERY MEASURES

Post-Fire
Recovery

Sheet-Rill
Erosion
Protection

Silt Fence
Practice



POST-FIRE RECOVERY MEASURES

Aerial Seeding, Silt
Fences, Diversion dike



Herriman Fire Exigency Work



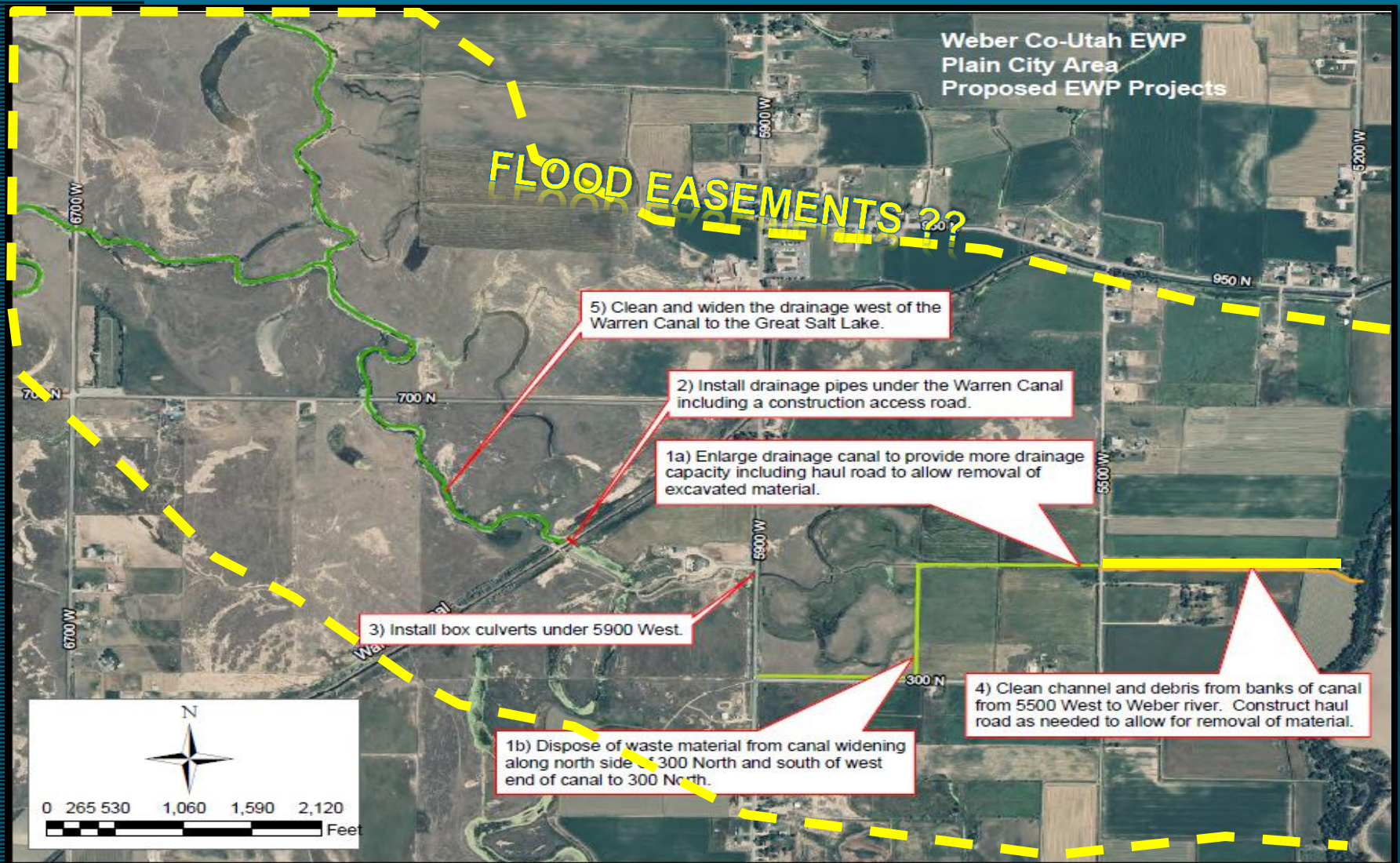
Post-Fire EWP - Herriman

Rock
check
dam

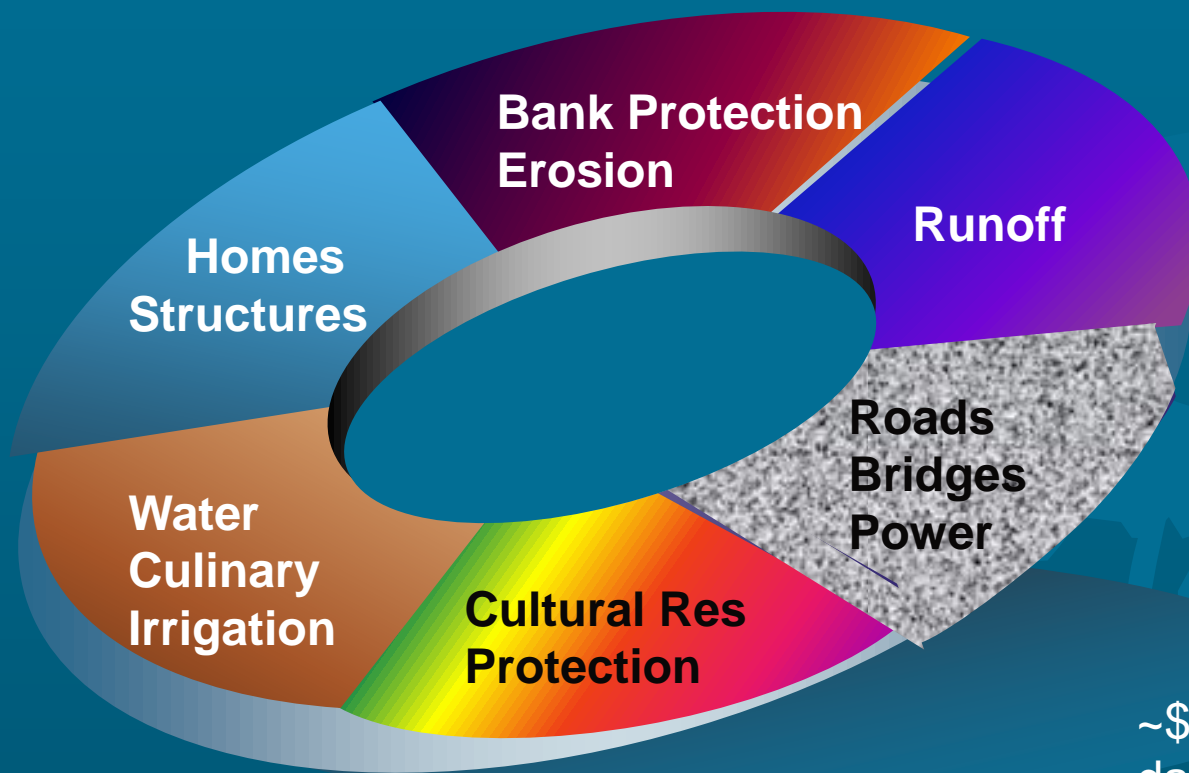
Rock
from
adjacent
slopes



Weber County EWP



Benefits – EWP Work



~\$135 million in damages averted in the St George area – Dec 2010 flood.

Thank You!

Weber River - 2011

